The Canadian Nuclear Industry

The Canadian Nuclear industry includes private and public sector organizations at both the federal and provincial levels.

Facts about nuclear energy in Canada:

- Provides 15% of Canada's electricity and 60% of Ontario's electricity
- 50 million tonnes of CO2 emissions per year are avoided with the help of nuclear energy displacing fossil fuels
  - Equivalent of taking 15 million passenger vehicles off the road
  - Ontario stopped burning coal to generate electricity in 2013 thanks to reliable nuclear energy
- $17 Billion per year - total contribution to the Canadian GDP
- $6 Billion in revenues - generated by nuclear industry
  - 76,00 jobs across Canada (direct and indirect)
  - 8,500 in the medical isotope industry alone
- Birthplace of CANDU reactor - internationally recognized and exported around the globe (Argentina, Romania, India, Pakistan, South Korea, China)
- Global leader in uranium supply
- Tier 1 nuclear nation - Canadian industry spans full nuclear life cycle (research and development, uranium mining, plant design, operations and maintenance, decommissioning, waste management)
- Global supplier of medical isotopes - approximately 75% of the world's supply of Cobalt-60 which is used to sterilize 45% of the world's single-use medical supplies

Why nuclear energy?

• Provides clean, reliable energy to help meet the increasing worldwide demand
• Produces no greenhouse-gas emissions that contribute to climate change

Canada can build on its rich history of 75 years of safe reliable nuclear generation and benefit from the advantages of small modular reactors

What Are Small Modular Reactors?

What are Small Modular Reactors (SMR)?

- Smaller than traditional nuclear reactors in footprint and output capacity
- Use the enriched uranium fuel fission process to generate energy that can be converted into electricity
- Range from community scale (less than 1 megawatt) to utility scale (approximately 300 megawatts), with or without transmission grid connection
- Can provide energy to remote communities and industrial sites not connected to the electricity grid
- More than 100 designs in development around the world; updated designs based on proven technologies that have existed around the world for 50+ years

Advantages of SMRs

- Safety:
  - Advanced safety features
  - Some designed to be installed underground, enhancing physical security
- Simpler:
  - Modular designs, factory-constructed
  - Fleet-based results in cost and schedule efficiency
- Adaptable:
  - Load-following source of electricity (adjusts its power output as demand for electricity fluctuates throughout the day)
  - “Scale-to-fit" - can add modules to meet energy demand
  - Generate heat for uses beyond just electricity
- Environment:
  - Produces no greenhouse gas emissions
- Cheaper:
  - Modular factory construction means lower up-front capital investment
- Enabler for other energy sources:
  - Enabler for renewable energy (solar, wind)
  - Can produce energy for battery charging or hydrogen for transportation

Canada's SMR Roadmap and Action Plan

- In 2018, Natural Resources Canada convened a group of representatives from power utilities and various Canadian provinces and territories to start a national conversation on the future of small modular reactors in Canada, resulting in the creation of Canada's SMR Roadmap.
- The Roadmap concluded that Canada could benefit from the safe, reliable and low-carbon energy created from SMRs through a number of on-grid and off-grid applications and that SMR may be a key enabler to achieving Canada's climate change targets.
- Given the existing nuclear industry expertise, Canada is well positioned for success in the development and deployment of SMRs in Canada, and potentially for international export.

• A key outcome of Canada's SMR Roadmap was the development of an SMR Action Plan, released in 2020, which outlined the concrete actions being taken by various organizations and government bodies to turn the Roadmap's recommendations into reality.

• As Canada's furthest advanced SMR project, Global First Power's Micro Modular Reactor Project at Chalk River is leading the advancement of SMRs in the country.

More information is available at

smrroadmap.ca smractionplan.ca